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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/754,951	01/09/2004	Lu Qian	72255/00012	8829

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EXAMINER	
JONES, HUGH M	
ART UNIT	**PAPER NUMBER**
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Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No.	Applicant(s)	
	10/754,951	QIAN ET AL.	
	Examiner	Art Unit	
	Hugh Jones	2128	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *03 August 2007*.

2a)☒ This action is **FINAL**. 2b)☐ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *23-30,32-38 and 40-47* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *23-30,32-38 and 40-47* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *1/9/2004* is/are: a)☒ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☐ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____.
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

DETAILED ACTION

1. Claims 23-30, 32-38, 40-47 of U. S. Application 10/754,951, filed 1/9/2004, are pending.

Claim Rejections - 35 USC § 103

2. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

3. The factual inquiries set forth in *Graham* **v.** *John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.
4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

4. Claims 23-30, 32-38, 40-47 are rejected under 35 U.S.C. 103(a) as being unpatentable over Berg in view of Ephremides et al. and in further view of Mahany et al..

5. Berg discloses taking the output of a network simulator and applying it directly to a network (fig. 5 and col. 9, lines 32-45), but supplies few details of the simulator.

6. Ephremides provides said details (as mapped subsequently).

7. It would have been obvious to one of ordinary skill in the art at the time of the invention to modify the Berg disclosure with the Ephremides teaching because Berg expressly teaches use of a network simulator to control the network (fig. 5 and col. 9, lines 32-45).

8. Berg discloses determining coverage, but does not expressly disclose determining coverage vs data rate.

9. Mahany discloses the inherent inverse relationship between coverage and data rate (col. 25, lines 1-9):

> "Utilization of the various transmissions modes results in variable immunity of the data signals from RF interference. The data terminal in which the radio is utilized thereby has the ability to extract the best system performance in every application regardless of multipath signal levels, interference levels and the sources thereof. *The data terminal also thereby has the ability to* ***dynamically trade data rate in return for coverage range*** *(coverage range being a function of process gain) without the need to change radio hardware.* Although not shown, capable of operating in the 2.4 GHz circuitry of FIG. 10 or other frequency ranges. Multiple intermediate frequency filter topology may be implemented to achieve interference rejection via varying filter selectivity."

10. It would have been obvious to one of ordinary skill in the art at the time of the invention to modify the Berg disclosure with the Mahany teaching because Mahany teaches the benefit of "*The data terminal also thereby has the ability to* ***dynamically trade data rate in return for coverage range***

(coverage range being a function of process gain) without the need to change radio hardware.".

11. Berg does not expressly disclose using the determined coverage vs data rate in the optimization.

12. Mahany discloses the inherent inverse relationship between coverage and data rate (col. 25, lines 1-9), as explained earlier.

13. It would have been obvious to one of ordinary skill in the art at the time of the invention to modify the Ephremides / Berg / Mahany teaching such that the determined coverage vs data rate is taken into account during the optimization for the following reasons.

14. As noted by the Court, when there is a *design need or market pressure* to solve a problem and there are a finite number of identified, predictable solutions, a person of ordinary skill has good reason to pursue the known options within his or her technical grasp. If this leads to the anticipated success, it is likely the product not of innovation but of ordinary skill and common sense. In that instance the fact that a combination was obvious to try might show that it was obvious under §103. *KSR Int'l v. Teleflex, Inc.*, 550 U.S. ___ (2007).

15. In this case, the "problem" facing those in the art was to provide the fastest data transfer rate and maximum coverage, as evidenced by study of the data rate vs. coverage problem, as well as by Applicant's admission in paragraph 41 of the specification. It would have been obvious to a skilled artisan to look for the optimal mix of data rate vs. coverage and thus to try it. There were a limited number of methodologies available to do so, namely network simulators and

optimization techniques. The skilled artisan would have had reason to try these methodologies with the reasonable expectation that at least one would be successful. The expectation of success is evidenced, for example, by Applicant's admission that a known network simulator (DES) was capable of performing the task:

> [0041] Additionally, it will be appreciated that the DES simulation tool of one embodiment provides a simulation environment directed to an IEEE 802.11 MAC protocol with C++. DES is configured to discern the impact of a PHY layer design or change in a wireless device on the MAC layer performance. For example, DES is capable of determining WLAN coverage range versus data rates. As well, DES, is capable of determining the WLAN capacity in terms of throughput of a multi-channel AP when channel interferences are significant.

16. "In determining whether the subject matter of a patent claim is obvious, neither the particular motivation nor the avowed purpose of the patentee controls. **What matters is the objective reach of the claim. If the claim extends to what is obvious, it is invalid under §103.** One of the ways in which a patent's subject matter can be proved obvious is by noting that there existed at the time of invention a known problem for which there was an obvious solution encompassed by the patent's claims." *KSR Int'l v. Teleflex, Inc.*, 550 U.S. ___ (2007).

17. In *Kahn*, the court affirmed the PTO's finding of obviousness, explaining at great length that a "teaching, suggestion, or motivation" can be found "implicitly" based on precisely the factors that the Solicitor General says are relevant: "what the combined teachings, knowledge of one of ordinary skill in the art, and the

nature of the problem to be solved as a whole would have suggested to those of ordinary skill in the art." 441 F.3d 987

18. In *Dystar Textilfarben v. C.H. Patrick* (06-1088), the court explained, "an implicit motivation to combine exists not only when a suggestion may be gleaned from the prior art as a whole, but when the 'improvement' is technology-independent and the combination of references results in a product or process that is more desirable, for example because it is stronger, *cheaper*, cleaner, *faster*, lighter, smaller, more durable, or *more efficient*." (emphasis added). In this case, the "problem" facing those in the art was to provide the *fastest* data transfer rate and to *maximize* coverage.

19. Specifically, Ephremides discloses:

23. A method comprising the steps of (abstract; fig. 1; line 35, col. 2 to line 22, col. 1):

receiving configuration data representative of a current configuration of an associated wireless local area network (fig. 1 # 102; fig. 3 "initial");

receiving characteristic data representative of at least one characteristic associated with the wireless local area network (fig. 1 # 102; fig. 3 "initial");

receiving optimization data representative of at least one optimization parameter (fig. 1 # 104, 106, 108, 110);

generating an optimal configuration data representative of an optimal configuration of the wireless local area network in accordance with the received configuration data, the characteristic data, and the optimization data (fig. 1 # 104, 106, 108, 110); and

dynamically modifying the current configuration of the associated wireless local area network in accordance with the generated optimal configuration data (fig. 1 # 104, 106, 108, 110, - # 112 – the results are applied to reconfigure the system).

24. The method of claim 23, wherein the step of generating optimal configuration data further comprises the step of applying an optimization algorithm to the optimization data (fig. 1 # 110; col. 6, lines 1-41; reference 8, incorporated in col. 2).

25. The method of claim 24, wherein the optimization algorithm is at least one of the group consisting of Newton's method and gradient search (col. 6, lines 1-41; reference 8, incorporated in col. 2).

26. The method of claim 23, the generating step further comprising performing at least one discrete event simulation in accordance with the received configuration data, the characteristic data, and the optimization data (fig. 1).

27. The method of claim 23, wherein the generating step further comprises simulating a network configuration with a discrete event driven medium access control protocol simulator (fig. 1).

28. (New) The method of claim 23, further comprising the step of displaying, via an associated display, graphical data representative of the generated optimal configuration data (fig. 3-7).

29. The method of claim 23, further comprising simulating one of a group consisting of throughput, noise mitigation, access point loading, voice distribution, data distribution propagation effects, transmit power, receiver sensitivity and adjacent channel interference (fig. 1, #104, 106; col. 3, lines 1-22).

30. The method of claim 23, further comprising simulating a plurality of a group consisting of throughput, noise mitigation, access point loading, voice distribution, data distribution propagation effects, transmit power, receiver sensitivity and adjacent channel interference (fig. 1, #104, 106; col. 3, lines 1-22).

32. A system comprising (fig. 1 # 104, 106, 108, 110, - # 112 – the results are applied to reconfigure the system):

means for receiving configuration data representative of a current configuration of an associated wireless local area network (fig. 1 # 104, 106, 108, 110);

means for receiving characteristic data representative of at least one characteristic associated with the wireless local area network (fig. 1 # 104, 106, 108, 110);

means for receiving optimization data representative of at least one optimization parameter (fig. 1 # 104, 106, 108, 110);

simulating means for generating optimal configuration data representative of an optimal configuration of the wireless local area network in accordance with the received configuration data, the characteristic data, and the optimization data coupled to the means for receiving configuration data (fig. 1 # 104, 106, 108, 110), the means for receiving characteristic data (fig. 1 # 104, 106, 108, 110) and the means for receiving optimization data (fig. 1 # 104, 106, 108, 110); and

means for dynamically modifying the current configuration of the associated wireless local area network responsive to the simulating means in accordance with the generated optimal configuration data (fig. 1 # 104, 106, 108, 110).

33. The system of claim 32, wherein the simulating means further comprises application means for applying an optimization algorithm to the optimization data (col. 6, lines 1-41; reference 8, incorporated in col. 2).

34. The system of claim 33, wherein the optimization algorithm is at least one of the group consisting of Newton's method and gradient search (col. 6, lines 1-41; reference 8, incorporated in col. 2).

35. The system of claim 32, further comprising communication means for communicating the optimal configuration data to a management tool (fig. 1 # 104, 106, 108, 110).

36. The system of claim 32, wherein the simulation means comprises means for performing a discrete event driven medium access control protocol simulation in accordance with the received configuration data, the characteristic data, and the optimization data (fig. 1 # 104, 106, 108, 110).

37. The system of claim 32, further comprising display means for displaying graphical data representative of the generated optimal configuration data (fig. 3-7).

38. The system of claim 32, further comprising means for receiving the
at least one optimization parameter from an associated user (fig. 1, 3-7).

40. An apparatus comprising (abstract; fig. 1; line 35, col. 2 to line 22, col. 1):

a management tool communicatively coupled to an associated wireless local area network for managing and modifying the associated wireless local area network, the management tools is configured to

receive configuration data representative of a current configuration of the associated wireless local area network and to receive characteristic data representative of at least one characteristic of the associated wireless local area network (fig. 1 # 104, 106, 108, 110);

a simulator for simulating at least one configuration of the associated wireless local area network (fig. 1 # 104, 106, 108, 110);

an interface device configured to facilitate data communication between the management tool and the simulator (fig. 1 # 104, 106, 108, 110);

a receiving device for receiving optimization data representative of at least one optimization parameter (fig. 1 # 104, 106, 108, 110),

wherein the configuration data, the characteristic data, and the optimization data are sent to the simulator from the management tool via the interface device, and the simulator is responsive to generate optimal configuration data representative of an optimal configuration of the associated wireless local area network in accordance with the received configuration data, the characteristic data, and the optimization data (fig. 1 # 104, 106, 108, 110);

wherein the data representative of an optimal configuration is sent via the interface device from the simulator to the management tool (fig. 1 # 104, 106, 108, 110);

wherein the management tool is configured to adjust the associated wireless network in accordance with the data representative of an optimal configuration; and

wherein the simulator is configured to continually receive the characteristic data and continually updates and dynamically modifies the optimal configuration of the associated wireless local area network (fig. 1 # 104, 106, 108, 110).

41. The apparatus of claim 40, wherein the simulator applies an optimization algorithm to the optimization data (col. 6, lines 1-41; reference 8, incorporated in col. 2).

42. The apparatus of claim 41, wherein the optimization algorithm is at least one of the group consisting of Newton's method and gradient search(col. 6, lines 1-41; reference 8, incorporated in col. 2).

43. The apparatus of claim 40, wherein the simulator is a discrete event driven medium access control protocol simulator (fig. 1).

44. The apparatus of claim 40, further comprising a transmission device for transmitting the optimal configuration data to the management tool, wherein the management tool dynamically modifies the current configuration of the associated wireless local area network in accordance with the generated optimal configuration data (fig. 1, #104, 106; col. 3, lines 1-22).

45. The apparatus of claim 40, wherein the simulator is configured to simulate one of the group consisting of throughput, noise mitigation, access point loading, voice distribution, data distribution propagation effects, transmit power, receiver sensitivity and adjacent channel interference (fig. 1, #104, 106; col. 3, lines 1-22).

Response to Arguments

20. Applicant's arguments, filed 8/3/2007, have been carefully considered but are not persuasive. Applicants are thanked for the amendment.

21. Applicants argue:

> **NON-ART REJECTIONS**
>
> Claims 23-45 stand rejected under 35 U.S.C. § 112, second paragraph, as being incomplete for omitting essential steps. The examiner points out that nothing is actually done with the determined "coverage vs. data rate." The examiner's objections are well taken. Accordingly, the applicant has amended the claims in response to the objections.

22. The 112 rejections are accordingly withdrawn.

23. Applicants argue:

> Mahany is directed to a data transceiver module for data communications in a portable hand-held data terminal that has multiple spread spectrum modes. Mahany does not teach or suggest varying data ranges and coverage areas for a plurality of access points in a wireless network in order to achieve an optimal configuration for the network. Berg, which is directed to adaptive cell coverage does not teach or suggest varying data rates versus coverage areas for a plurality of access points to achieve an optimal configuration. Berg is directed towards cellular communications, which typically has stringent date rate requirements. Ephremides, like Berg, does not mention varying coverage area versus data rate in generating simulations. Ephremides was filed after Mahany and yet does not teach or suggest varying coverage area versus data rate for a plurality of access points to achieve an optimal configuration.

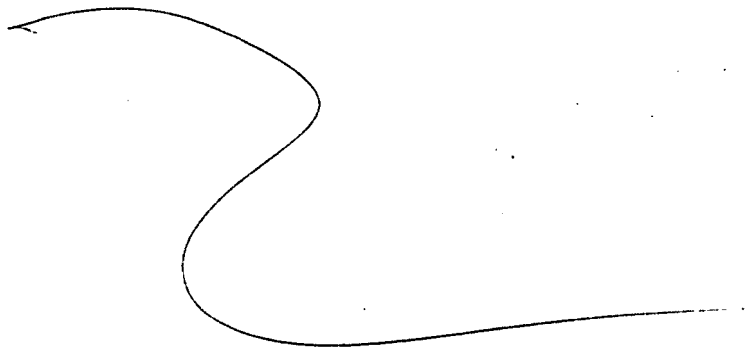
24. As explained in the last office action:

Applicant's arguments against Berg and Ephremides are not persuasive. Both disclose determining coverage (the nature of the problem in the art). See, for example: Ephremides at col. 1, lines 6-8 (The present invention is directed to a method for placement of transmitters in an indoor or outdoor wireless network to optimize coverage.); Berg: title, fig. 1.

Mahany discloses the *inherent* inverse relationship between coverage and data rate (col. 25, lines 1-9):

> "Utilization of the various transmissions modes results in variable immunity of the data signals from RF interference. The data terminal in which the radio is utilized thereby has the ability to extract the best system performance in every application regardless of multipath signal levels, interference levels and the sources thereof. *The data terminal also thereby has the ability to* ***dynamically trade data rate in return for coverage range*** *(coverage range being a function of process gain) without the need to change radio hardware.* Although not shown, capable of operating in the 2.4 GHz circuitry of FIG. 10 or other frequency ranges. Multiple intermediate frequency filter topology may be implemented to achieve interference rejection via varying filter selectivity."

Furthermore, Applicants have admitted (specification) that the Cisco DES simulator discloses determining data rates vs coverage:



> [0041] Additionally, it will be appreciated that the DES simulation tool of one embodiment provides a simulation environment directed to an IEEE 802.11 MAC protocol with C++. DES is configured to discern the impact of a PHY layer design or change in a wireless device on the MAC layer performance. For example, DES is capable of determining WLAN coverage range versus data rates. As well, DES, is capable of determining the WLAN capacity in terms of throughput of a multi-channel AP when channel interferences are significant.

25. Applicants have been silent in response. It would also appear that any network has more than one access point.

Conclusion

26. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

27. A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

28. Any inquiry concerning this communication or earlier communications from the examiner should be:

directed to: Dr. Hugh Jones telephone number (571) 272-3781,

Monday-Thursday 0830 to 0700 ET,

or

the examiner's supervisor, Kamini Shah, telephone number (571) 272-2279.

Any inquiry of a general nature or relating to the status of this application should be directed to the Group receptionist, telephone number (703) 305-3900.

mailed to:

Commissioner of Patents and Trademarks
Washington, D.C. 20231

or faxed to:

(703) 308-9051 (for formal communications intended for entry)

or (703) 308-1396 (for informal or draft communications, please label *PROPOSED* or *DRAFT*).

Dr. Hugh Jones
Primary Patent Examiner
August 15, 2007

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